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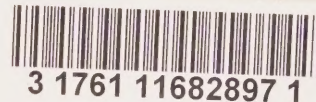
Canada. Fisheries Research Board, Biological  
Station, St. Andrews, N.B.

# FISHERIES RESEARCH BOARD (OF CANADA)

## Atlantic Biological Station

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## Clam Farming in the Maritimes - Preliminary Information

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### Need for Clam Farming

During the last six or seven years an increased demand for clams, resulting partly from expansion of the shucking industry, led both to more extensive and more intensive digging. At first, production rose but very soon over-fishing brought about depletion of many beds and, consequently, a reduced production stifling the industry in some districts. It is desirable to restore production and maintain it at a high level. New England experience has shown the value of clam farming for this purpose. Experiments to develop and test clam farming methods under our own conditions have been conducted by the Fisheries Research Board. In Nova Scotia the provincial Department of Industry and Publicity has assisted.

### What is Clam Farming?

The principal step in clam farming is the transfer of small clams (seed) from areas where they are over-crowded, or for other reasons unlikely to mature properly, to good growing and maturing grounds.

**Seed Collection:** Many harbours have extensive tide flats populated with small clams crowded to densities of 60, 80, 100 or more per square foot. Seed collection is attempted only in such places, which are often at high levels on the beach. In spite of their small size, a bushel of these clams can be dug by hand in about the same time as a bushel of large clams which seldom occur in such heavy concentrations. The most satisfactory seed are  $1\frac{1}{4}$  to  $1\frac{3}{4}$  inches in length. Smaller clams are too fragile to handle. Larger ones do not establish themselves readily when transplanted. Seed must be carefully handled.

**Handling:** Between digging and planting, seed must be kept cool and moist. They may be stored in air out of the sun or left on the tide flat near or at low-water mark, where they will be covered by salt water during the greater part of the tidal cycle. They should not be exposed to fresh or brackish water, and never covered by stagnant water in tubs, puncheons, or dories. The use of shallow wooden containers prevents undue pressure on the bottom layers. The clams may be further protected by lining the containers with seaweed. Seed clams should be jostled as little as possible; hence trucking is

undesirable if boat transport from the digging to the planting ground is available. Planting should be done as soon as possible, preferably the same day as digging, and never later than the third day after digging.

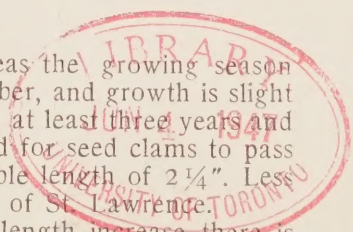
**Planting:** In some of the New England States seed clams are dropped like potatoes in furrows made with a hand plough. The furrows are placed 4 to 5 inches apart and clams dropped about 4 to the foot. The clams in each planted furrow are covered by soil when the next new furrow is ploughed. While slow and costly, this method insures a high percentage burial and an even distribution of the stock. A quicker and cheaper method is broadcasting by hand onto the beach at low tide, or sometimes from a boat at flood or high-slack tide. The clams scattered in this way dig themselves into the soil by their own efforts. Scuffling the surface of the flat with a hand cultivator before planting insures a higher percentage burial. One man scuffling can usually prepare the ground fast enough to keep three planters busy. On the average, a careful planter broadcasts about 8 to 10 bushels of seed per hour.

If planting is done by broadcasting it is important that the weather be reasonably calm and tidal currents slight; otherwise, the seed will "bunch" in depressions, or even be washed off the planting area altogether. Sometimes it is worth while postponing planting for several hours, or even a day, until satisfactory weather and water conditions are obtained. The clams should be scattered with care to avoid undue breakage and to assure an even distribution to a density of about 15 per square foot. For  $1\frac{1}{2}$ -inch seed about 200 bushels per acre is required. Normally three-quarters of the seed will have buried themselves ("caught") by the next low tide. Experience indicates that spring is best for planting, but the operation need not be limited to this season.

### Growth Rate

In our outer coast areas the growing season lasts only from May to October, and growth is slight—about  $\frac{1}{4}$ " per year. Thus, at least three years and more often four are required for seed clams to pass the minimum legal marketable length of  $2\frac{1}{4}$ ". Less time is required in the Gulf of St. Lawrence.

Corresponding to this length increase there is about a four-fold increase in volume. At the  $2\frac{1}{4}$ -





inch size the volume of a clam almost doubles with a half-inch increase in length. Under favourable conditions for survival and growth it is therefore worth while to allow clams to grow somewhat beyond the minimum marketable size before harvesting.

With experience, those interested in clams will find the growth lines on the shell useful in estimating ages and growth rates.

### **Survival**

There is a substantial loss at planting. This results from breakage of clams or their failure to bury themselves. Under good conditions this loss is often as high as 25%. Following the planting there is an annual loss which ranges from 2 to 10%. In good areas it seems reasonable to expect a survival after 4 years of about 70% of the clams that "caught".

In some districts extensive and unpredictable "winter-killing" occurs. This is not well understood, but is thought to result from smothering under heavy ice lying on the beaches.

Little is known about the natural enemies of clams. Investigations are now in progress on the activities of the smooth whelk, a species of snail which is a serious enemy.

### **Choice of Ground**

Conditions permitting rapid growth generally favour high survival and fat meats. Ground for clam farming should be selected to insure fast growth and that requires active water circulation, because clams depend on water currents to bring them their food. Circulation should be vigorous but the ground should not be exposed to wave action or to tidal currents to such an extent that the soil shifts seriously. Good growing grounds are not generally found near the heads of harbours or in small coves with narrow outlets. Growth is best at or near low-water mark and poor at high levels on the beach.

Sandy soils are preferable for planting. Mild rippling of the surface is not a dangerous sign but coarse, loose, shifting sand is unfavourable both to growth and survival. Gravel-mud combinations are often satisfactory. Soft muds, grounds with razor clams or tube-forming sand worms, or grounds covered with mussels, eel grass, or other sea weeds are to be avoided.

### **Prospects**

Most of the Fisheries Research Board's trial plantings have been made on the outer coast of Nova Scotia in intensively fished areas where there are signs of depletion. Encouraging results have been obtained in parts of Musquodoboit, Clam and Petpeswick Harbours. Clam farming is hard work and does not seem to have get-rich-quick possibilities. Nevertheless, on the best grounds in the areas mentioned it appears that returns equivalent to good wages could be made by clam farming. Further investigation is required before more definite statements are possible.

### **Control of Ground**

To get a return for his work the clam farmer must have control of the ground he develops. Policies which would make ground available for private clam farming without interference with the public fishery are under consideration.

### **Work Continuing**

Clam farming trials are continuing and our understanding of the many problems involved is improving. The information compiled in this circular is designed to answer some of the more frequent inquiries on this subject that are addressed to the Fisheries Research Board. Other advice may be had by writing to the Director of this Station.

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Circulars No. 1 and 3 on the Irish moss industry in the Maritime provinces are out of print and will be superseded by a circular now in preparation.

No. 2, "Canadian Atlantic Offshore Fish Landings, 1938-1940 Inclusive" is available for limited distribution only.

No. 4, "Wider Lath Spaces Protect Short Lobsters"; No. 5, "Long-Lining Improves Fishing Efficiency"; No. 6, "Green-Gilled Oysters are Wholesome"; No. 7, "The Prairie 'Jigger' for Setting Gill Nets Under Ice"; and No. 8, "Improve Trout Angling by Poisoning Coarse Fish", are still available on request.